APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,472	10/29/2003	Changick Kim	AP174HO	6963

20178   7590   10/30/2006

EPSON RESEARCH AND DEVELOPMENT INC
INTELLECTUAL PROPERTY DEPT
2580 ORCHARD PARKWAY, SUITE 225
SAN JOSE, CA 95131

EXAMINER
TORRES, JOSE

ART UNIT	PAPER NUMBER
2112	

DATE MAILED: 10/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/696,472	KIM ET AL.
	Examiner	Art Unit
	Jose M. Torres	2112

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 October 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date *10/29/2003*.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Comments

1.   The Preliminary Amendments filed on October 28, 2004 has been

entered.

Drawings

2.   The drawings are objected to because in page 9 lines 20-21, points y_1, y_2,

y_3, and y_4 are described as being positioned clockwise, but their corresponding

figure does not correspond to the description. Examiner recommends replacing

y_3 with y_4 and vice versa.

3.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5)

because they include the following reference character(s) not mentioned in the

description: "Region 120" in Figure 5.

4.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5)

because they do not include the following reference sign(s) mentioned in the

description: "Operation 133" in page 15 lines 16. However, it appears to be

operation 136 shown in Figure 9 and not mentioned in the specification, and has

been treated as such.

5.   Corrected drawing sheets in compliance with 37 CFR 1.121(d) are

required in reply to the Office action to avoid abandonment of the application.

Any amended replacement drawing sheet should include all of the figures

appearing on the immediate prior version of the sheet, even if only one figure is

being amended. Each drawing sheet submitted after the filing date of an

application must be labeled in the top margin as either "Replacement Sheet" or

"New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by

the examiner, the applicant will be notified and informed of any required

corrective action in the next Office action. The objection to the drawings will not

be held in abeyance.

Specification

6.   The specification is objected to as failing to provide proper antecedent

basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP

§ 608.01(o). Correction of the following is required:

Claim 7 lines 3-4: "where a horizontal direction variable is held constant."

Claim 8 lines 3-4: "where a vertical direction variable is held constant."

Appropriate correction is required.

Claim Rejections - 35 USC § 101

7.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or
> composition of matter, or any new and useful improvement thereof, may obtain a patent
> therefor, subject to the conditions and requirements of this title.

8.   Claims 17-26, 38, and 43 are rejected under 35 U.S.C. 101 because the

claimed invention is directed to non-statutory subject matter.

Re claims 17-26: the claim limitations "A (The) computer readable

medium" are intended to cover an electromagnetic carrier wave as mentioned on

page 22 lines 6-8 in the specification. Since a carrier wave is not a tangible,

physical article or object to constitute a manufacture, and it's not a machine, process or composition of matter, the previously mentioned claims does not fall within a statutory category of invention. The examiner suggests replacing the claim limitations with -- A computer readable medium having stored thereon a computer program executed by a computer to perform --, and deleting the sentence "The computer readable medium also includes an electromagnetic carrier wave in which the computer code is embodied." In page 22 lines 6-8 of the specification.

Re claims 38 and 43: the claim limitation "hardware, software, or a combination thereof" in lines 2-3 respectively are intended to cover software itself which do not constitute statutory subject matter. Furthermore it is intended to non-functional descriptive material, which cannot be made statutory even if claimed as recorded on some computer readable medium.

Claim Rejections - 35 USC § 112

9.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10.   Claims 38 and 43 are rejected under 35 U.S.C. 112, second paragraph.

The claim limitation "software" in claims 38 and 43 seem to change the meaning of the independent claims 33 and 39 respectively. The integrated circuit of claims 33 and 39 are clearly hardware and a dependant claim can not broaden the scope of an independent claim.

Claim Rejections - 35 USC § 102

11.   The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12.   Claims 1, 3, 4, 9, 10, 17, 19, 20, 22, 33, 35, 36, and 38 are rejected under

35 U.S.C. 102(b) as being anticipated by Silver et al. (U.S. 6,408,109 B1).

Re claim 1: Silver et al. discloses a method for upscaling image data,

comprising: identifying a gradient value associated with a pixel location of

the image data; determining whether a direction associated with the pixel

location is horizontal direction or a vertical direction (Col. 2 lines 66-67 and

Col. 3 lines 1-3); and applying a weighted interpolation scheme to a value

corresponding to the pixel location when the direction is a horizontal

direction or a vertical direction (Col.3 lines 58-61).

Re claim 3: Silver et al. discloses the method operation of identifying a

gradient value associated with a pixel location of the image data including:

determining a partial derivative associated with the pixel location (Col. 6

lines 24-27).

Re claim 4: Silver et al. discloses the method operation of determining whether a direction associated with the pixel location is a horizontal direction or a vertical direction including: defining a horizontal component of the gradient value (G_X); defining a vertical component of the gradient value (G_Y); and calculating a magnitude of the gradient value (G_O) from the horizontal component and the vertical component (Col. 7 lines 47-49).

Re claim 9: Silver et al. discloses the gradient is defined as a two dimensional vector $((R_O, S_O)$ Col. 9 lines 2-3, 46-47, and Equations 2A and 2B).

Re claim 10: Silver et al. discloses the method operation of applying a weighted interpolation scheme to the pixel location when the direction is a horizontal direction or a vertical direction including: transforming coordinates representing the pixel location through a function having a sigmoidal shape (Fig. 5, Col. 15 lines 51-55).

Re claim 17: Silver et al. discloses a computer readable medium having program instructions for upscaling image data (Col. 8 lines 11-12), comprising: program instructions for identifying a gradient value associated with a pixel location of the image data; program instructions for determining whether a direction associated with the pixel location in a horizontal direction or a vertical direction (Col. 2 lines 66-67 and Col. 3

lines 1-3); and program instructions for applying a weighted interpolation

scheme to the pixel location when the direction in a horizontal direction or

a vertical direction (Col.3 lines 58-61).

Re claim 19: Silver et al. discloses the program instructions for

determining a partial derivative associated with the pixel location (Col. 6

lines 24-27).

Re claim 20: Silver et al. discloses the program instructions for defining a

horizontal component of the gradient (G_X); program instructions for

defining a vertical component of the gradient value (G_Y); and program

instructions for calculating a magnitude of the gradient value (G_O) from the

horizontal component and the vertical component (Fig. 2A and Col. 7 lines

47-49).

Re claim 22: Silver et al. discloses the program instructions for

transforming coordinates representing the pixel location through a function

having a sigmoidal shape (Fig. 5, Col. 15 lines 51-55).

Re claim 33: Silver et al. discloses an integrated circuit capable of scaling

image data (Col. 8 lines 11-12) comprising: logic for calculating a gradient

value associated with a pixel location of the image data; logic for

determining whether an angle defined by a vector associated with the

gradient value and an axis is a substantially parallel angle or a

substantially perpendicular angle; and logic for applying a weighted

interpolation scheme to the pixel location when a) the direction is a

horizontal direction or a vertical direction and b) the gradient value

exceeds a threshold value (Col 13 lines 42-44).

Re claim 35: Silver et al discloses logic for determining a partial derivative

associated with the pixel location (Col. 6 lines 24-27).

Re claim 36: Silver et al. dislcoses logic for defining a horizontal

component of the gradient value (G_X); logic for defining a vertical

component of the gradient value (G_Y); and logic for calculating a

magnitude of the gradient value from the horizontal component and the

vertical component (G_O, Col. 7 lines 47-49).

Re claim 38: Silver et al. discloses the integrated circuit wherein each

logic element is hardware, software, or a combination thereof (Col. 8 lines

11-12).

Claim Rejections - 35 USC § 103

13.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to

> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

14.   Claims 2, 5-8, 18, 21, 34, and 37 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Silver et al. in view of Hsu et al. (U.S. 5,991,464).

Silver et al. teaches computing a direction angle (G_θ) associated with the

pixel location based upon both the horizontal (G_X) component and the vertical

component (G_Y); and comparing the magnitude of the gradient value to a

threshold value, wherein if the threshold value is greater than the magnitude

(Col. 13 lines 42-44) as recited in claim 5, the method operation of computing a

direction angle associated with the pixel location based upon both the horizontal

component and the vertical component including: defining the direction angle

relative to a horizontal axis (Col. 7 lines 47-49) as recited in claim 6, the method

operation of defining a horizontal component of the gradient value including,

defining a partial derivative where a horizontal direction variable is held constant

(Col. 6 lines 24-27) as recited in claim 7, the method operation of defining a

vertical component of the gradient value including, defining a partial derivative

where a vertical direction variable is held constant (Col. 6 lines 24-27) as recited

in claim 8, the program instructions for computing a direction angle (G_θ)

associated with the pixel location based upon both the horizontal component and

the vertical component; and program instructions for comparing the magnitude of

the gradient value to a threshold value (Col. 13 lines 42-44) as recited in claim

21, and for computing a direction angle (G_θ) associated with the pixel location

based upon both the horizontal component and the vertical component; logic for

comparing the magnitude of the gradient value to a threshold value (Col. 13 lines 42-44) as recited in claim 37.

However, Silver et al. fails to disclose applying a bilinear interpolation scheme or a bicubic interpolation scheme to the value corresponding to the pixel location when the direction is one of a non-horizontal direction or a non-vertical direction, applying a bilinear interpolation scheme or a bicubic interpolation scheme to the value corresponding to the pixel location irrespective of the direction, program instructions for applying a bilinear interpolations scheme or a bicubic interpolation scheme to the pixel location when the direction is a non-horizontal or a non-vertical direction, program instructions for applying a bilinear interpolation scheme or a bicubic interpolation scheme to the pixel location when the magnitude of the gradient value exceeds the threshold value, logic for applying a bilinear interpolation scheme or a bicubic interpolation scheme to the pixel location when the direction is one of a non- horizontal direction or a non-vertical direction, and logic for applying a bilinear interpolation scheme or a bicubic interpolation scheme to the pixel location when the threshold value is greater than the gradient value.

Hsu et al. teaches the method steps of applying a bilinear interpolation scheme or a bicubic interpolation scheme to the value corresponding to the pixel location when the direction is one of a non-horizontal direction or a non-vertical direction (Col. 5 lines 12-14) as recited in claim 2, and applying a bilinear interpolation scheme or a bicubic interpolation scheme to the value corresponding to the pixel location irrespective of the direction (Col. 5 lines 12-

14) as recited in claim 5, program instructions for applying a bilinear

interpolations scheme or a bicubic interpolation scheme to the pixel location

when the direction is a non-horizontal or a non-vertical direction (Col. 5 lines 12-

14) as recited in claim 18, program instructions for applying a bilinear

interpolation scheme or a bicubic interpolation scheme to the pixel location when

the magnitude of the gradient value exceeds the threshold value (Col. 5 lines 12-

14) as recited in claim 21 and logic for applying a bilinear interpolation scheme or

a bicubic interpolation scheme to the pixel location when the direction is one of a

non- horizontal direction or a non-vertical direction (Col. 5 lines 12-14) as recited

in claim 34, and logic for applying a bilinear interpolation scheme or a bicubic

interpolation scheme to the pixel location when the threshold value is greater

than the gradient value (Col. 5 lines 12-14) as recited in claim 37.

Therefore, in view of Hsu et al., it would have been obvious to one of

ordinary skill in the art at the time the invention was made to modify Silver et al.'s

method by incorporating the method step of applying a bilinear interpolation

scheme or a bicubic interpolation scheme to the value corresponding to the pixel

location when the direction is one of a non-horizontal direction or a non-vertical

direction and or irrespective of the direction and when the magnitude of the

gradient value exceeds a threshold value in order to create an enhanced

resolution video image.

15.   Claims 11-15, and 23-32 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Challapali et al. (U.S. 6,298,090 B1) in view of Silver et al.

Challapai et al. teaches a method for scaling video data, comprising:

determining whether a block of image data of a current frame is flagged to

indicate a level of difference with a corresponding block of image data of a

previous frame (Col. 8 lines 63-67); if the block of image data of the current

frame is flagged to indicate a level of difference with the corresponding block of

image data of the previous frame (Col. 9 lines 1-2) as recited in claim11, copying

upscaled data representing the corresponding block image data of the previous

frame into an upscaled block of the image data of the current frame (Col. 5 lines

10-15) as recited in claim 12. A computer readable medium having instructions

for scaling video data (Col. 2 lines 27-28), comprising program instructions for

determining whether a block of image data of a current frame is flagged to

indicate a level of difference with a corresponding block of image data of a

previous frame (Col. 8 lines 63-67) as recited in claim 23, a system for

processing block based image data, comprising: an encoder (4) configured to

compress video data (Col. 6 lines 1-3), the encoder configured to set a coded

block indicator to a first value ("1") when inter frame redundancies between

corresponding blocks of successive frames of a video stream exceed a threshold

value, the encoder further configured to set the coded block indicator to a second

value ("0") when the inter frame redundancies between successive frames of a

video stream are less than or equal to the threshold value (Col. 4 lines 56-67 and

Col. 5 lines 1-4); a decoder (5) configured to decompress the video data (Col. 5

lines 5-7), and a scaling module configured to scale the decompressed video

data, the scaling module including circuitry for identifying the coded block

indicator for each block (Col. 5 lines 7-15) as recited in claim 27, the threshold

represents a summation of differences between corresponding pixel values of the

successive frames of the video stream (Col. 2 lines 33-37) as recited in claim 28,

circuitry for copying a block corresponding to the pixel location from a previous

frame when the coded block indicator is equal to the second value (Col. 5 lines

10-15) as recited in claim 29, and the scaling module is incorporated into the

decoder (5, Col. 5 lines 5-7) as recited in claim 30.

However, Challapai et al. fails to disclose the method step of applying a

weighted interpolation scheme adaptively to each pixel location within the block

of image data of the current frame based upon a direction associated with the

pixel location, determining whether a direction associated with a pixel is a

horizontal direction or a vertical direction, identifying a gradient value associated

with the pixel; defining a horizontal component of the gradient value; defining a

vertical component of the gradient value; and calculating a magnitude of the

gradient value from the horizontal component and the vertical component,

transforming coordinates representing a particular pixel location through a

function associated with a sigmoidal shape, program instructions for applying a

weighted interpolation scheme adaptively to a pixel location within the block of

image data of the current frame based upon a direction associated with the pixel

location when the block of image data of the current frame is flagged to indicate a

level of difference with the corresponding block of image data of the previous

frame, program instructions for determining whether a direction associated with a

pixel is a horizontal direction or a vertical direction, program instructions for

identifying a gradient value associated with the program instructions for defining

a horizontal component of the gradient program instructions for defining a vertical

component of the gradient value; and program instructions for calculating a

magnitude of the gradient value from the horizontal component and the vertical

component, program instructions for transforming coordinates representing one

of the each pixel location through a function having a sigmoidal shape, circuitry

for adaptively applying a weighted interpolation scheme to a pixel location within

a current frame when the coded block indicator is equal to the first value, circuitry

for determining whether a direction associated with a gradient corresponding to

the pixel location is a horizontal direction or a vertical direction, and circuitry for

calculating a magnitude of the gradient from both a horizontal component of the

gradient and a vertical component of the gradient.

Silver et al. teaches the method steps and program instructions for

applying a weighted interpolation scheme adaptively to each pixel location within

the block of image data of the current frame based upon a direction associated

with the pixel location (Col.3 lines 58-61) as recited in claims 12 and 23,

determining whether a direction associated with a pixel is a horizontal direction or

a vertical direction (Col. 2 lines 66-67 and Col. 3 lines 1-3) as recited in claims 13

and 24, identifying a gradient value associated with the pixel; defining a

horizontal component of the gradient value (G_X); defining a vertical component of

the gradient value (G_Y); and calculating a magnitude of the gradient value from

the horizontal component and the vertical component (G_O, Col. 7 lines 47-49) as

recited in claims 14 and 25, transforming coordinates representing a particular

pixel location through a function associated with a sigmoidal shape (Fig. 5, Col.

15 lines 51-55) <u>as recited in claims 15 and 26</u>. Circuitry for adaptively applying a

a weighted interpolation scheme to a pixel location within a current frame when

the coded block indicator is equal to the first value (Col.3 lines 58-61) <u>as recited</u>

<u>in claim 27</u>, circuitry for determining whether a direction associated with a

gradient corresponding to the pixel location is a horizontal direction or a vertical

direction (Col. 2 lines 66-67 and Col. 3 lines 1-3) <u>as recited in claim 31</u>, and

circuitry for calculating a magnitude of the gradient (G_O) from both a horizontal

component (G_X) of the gradient and a vertical component of the gradient (G_Y,

Col. 7 lines 47-49) <u>as recited in claim 32</u>.

Therefore, in view of Silver et al., it would have been obvious to one of

ordinary skill in the art at the time the invention was made to modify Challpai et

al.'s invention by incorporating the method steps, program instructions, and

circuitry for applying a weighted interpolation scheme adaptively to each pixel

location within the block of image data of the current frame based upon a

direction associated with the pixel location, determining whether a direction

associated with a pixel is a horizontal direction or a vertical direction identifying a

gradient value associated with the pixel; defining a horizontal component of the

gradient value; defining a vertical component of the gradient value; and

calculating a magnitude of the gradient value from the horizontal component and

the vertical component, transforming coordinates representing a particular pixel

location through a function associated with a sigmoidal shape in order to

reproduce a smooth video image without noise due to a smoothing effect through interpolation, while preventing degradation edges in graphic image regions.

16.   Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Challapali et al. as modified by Silver et al., as applied to claim 11 above, and further in view of Hsu et al. The teachings of Challapali et al. modified by Silver et al. have been discussed above.

The teachings of Challapali et al. modified by Silver et al. teaches the method step of computing a direction angle (G_θ) associated with each pixel location based upon both the horizontal and the vertical component; and comparing the magnitude of the gradient value to a threshold value (Col. 13 lines 42-44).

However, the teachings of Challapai et al. modified by Silver et al. fails to disclose the method step of applying a bilinear interpolation scheme or a bicubic interpolation scheme to a value corresponding to the pixel location.

Hsu et al. teaches the method step of applying a bilinear interpolation scheme or a bicubic interpolation scheme to a value corresponding to the pixel location (Col. 5 lines 12-14).

Therefore, in view of Hsu et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Challapi et al's invention as modified by Silver et al. by incorporating the method step of applying a bilinear interpolation scheme or a bicubic interpolation scheme

to a value corresponding to the pixel location in order to create an enhanced resolution video image.

17.   Claims 39-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silver et al. in view of Challapali et al. further in view of Hsu et al.

Silver et al. teaches an integrated circuit capable of scaling video data (Col. 8 lines 11-12), comprising logic for applying a weighted interpolation scheme adaptively to a pixel location within the block of image data of the current frame based upon a direction associated with the pixel location (Col. 3 lines 58-61) as recited in claim 39, logic for transforming coordinates representing a particular pixel location through a function associated with a sigmoidal shape (Fig. 5 Col. 15 lines 51-55) as recited in claim 40, logic for determining whether a direction associated with a pixel is a horizontal direction or a vertical direction (Col. 2 lines 66-67 and Col. 3 lines 1-3) as recited in claim 41, and each logic element is hardware, software, or a combination thereof (Col. 8 lines 11-12) as recited in claim 43.

However, Silver et al. fails to disclose logic for determining whether a block of image data of a current frame is flagged to indicate a level of difference with a corresponding block of image data of a previous frame; logic for applying a biliniear interpolation scheme when the direction associated with the pixel location excludes the weighted interpolation scheme, and logic for detecting the flag.

Challapali et al. teaches logic for determining whether a block of image data of a current frame is flagged to indicate a level of difference with a corresponding block of image data of a previous frame (Col. 5 lines 7-10) as recited in claim 39, and logic for detecting the flag (Col. 5 lines 7-10) as recited in claim 42.

Hsu et al. teaches logic for applying a bilinear interpolation scheme when the direction associated with the pixel location excludes the weighted interpolation scheme (Col. 5 lines 12-14) as recited in claim 39.

Therefore, in view of Challapali et al. further in view of Hsu et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Silver et al.'s invention as modified by Challapali et al. by including logics for determining whether a block of image data of a current frame is flagged to indicate a level of difference with a corresponding block of image data of a previous frame, for detecting the flag, and for applying a bilinear interpolation scheme when the direction associated with the pixel location excludes the weighted interpolation scheme in order to increase the quality of the image displayed.

Conclusion

18.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shezaf et al. disclose a method and apparatus for improved image interpolation, Sekine et al. disclose an image resolution method and apparatus thereof, Han et al. disclose a two-dimensional non-linear

interpolation system based on edge information and two-dimensional mixing interpolation system using the same, Izumi et al. disclose an apparatus and method for processing moving image data, and Dodgson disclose a quadratic interpolation for image resampling.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jose M. Torres whose telephone number is 571-270-1356. The examiner can normally be reached on Monday thru Friday: 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong-Suk (James) Lee can be reached on 571-272-7044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMT
10/16/06

JONG SUK LEE
SUPERVISORY PATENT EXAMINER